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AUTHOR Pisapia, John
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ABSTRACT

Issues related to educational technology are examined from the equity viewpoint, and suggestions are made to address equity issues. Equity in school computer use must involve not only equal access but also equal consideration of the learning needs of poor, minority, and female students. Unfortunately, equity has become a quantitative idea, measured by counting computers and computing averages and ratios. This leads to ignoring the inequities found between rich and poor, urban and rural, and minority and nonminority students. Equity issues related to educational technology have been defined as: (1) access to computer literacy and computer-assisted learning; (2) tracking through differential users of computer technology; and (3) exposure to gender bias and stereotyping in educational software. The evidence seems to be clear on the relationship of socioeconomic status and equitable distribution and use of computers in schools. Other factors may be related to equity, such as the design or content of software and amounts of keyboard time. Standards could be developed to address potential inequities in computer use, and school policies should incorporate ideas into their technology policies that include all faculty in training and expose all students to computers in at least one learning situation. Equitable software, parent training sessions, and the infusion of computers into the curriculum are among the approaches educators should take to ensure equity in educational technology use. (SLD)

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TECHNOLOGY: THE EQUITY ISSUE

The purpose of this research brief is to examine technology from the equity viewpoint. The equity issue is reviewed through patterns of use and resource availability. Then, suggestions are made to address equity issues.

Is equity an important issue?

Equity in school computer use must involve not only equal access, but also consideration of the learning needs of poor, minority and female students. Poor children are unlikely to have resources apart from the school system to meet their learning needs — there is no other option (Malcom, 1988). This means equity must be a priority, a part of every policy decision and every classroom action (Sutton, 1989).

Unfortunately, equity has become a quantitative idea. It is measured by counting and computing averages and ratios. The ratio of computers to students, the number of minutes of computer time, the number of software packages designed for girls, the ratio of black faces to white faces on a screen display, and the number from various ethnic groups enrolled in computer courses are computed and compared in order to assess computer equity (Damarin, 1989).

What forms of inequities are found in technology use?

Inequities have been noted between rich and poor, urban and rural, and minority and non-minority students. For example, the current range of per pupil expenditure for public education is so wide ($2,000 to $17,000 per year), that equitable access to technology is almost impossible (Vision: Test, 1990).

Equity issues have been defined as 1) access to computer literacy and computer-assisted learning, 2) tracking through differential users of computer technology and 3) exposure to gender bias and stereotyping in educational software (Wisconsin Plan, 1990).

What does the research say?

The findings on **access** are mixed and somewhat confusing. For instance, the ratio of students to computers was found to be nearly twice as favorable for schools containing low socioeconomic status (SES) students (U.S. Congress, 1987 hereafter cited as "OTA").

Other studies report that schools with high minority enrollment have less than one-half the computer access, compared to students with majority enrollments (Becker & Sterling, 1987). In addition, students in relatively poor districts have significantly less access to computers than peers in relatively affluent schools (Bauman, 1988).

Secondly, some observers feel schools in inner-city and poor areas are being priced out of the computer market. Students already advantaged because of wealth would be further advantaged in employment because of access to computers in schools or at home. However, Piccano (1991) found that in a typical New York City elementary school you would find the same number of computers as in a typical elementary school in Westchester County, New York; in the high schools there were more.

What is the relationship of socioeconomic factors and computer access?

The strength of the evidence seems to be clear on the relationship of socioeconomic factors and equitable distribution and use of computers in schools. For instance, **socioeconomic factors** appear to play a disturbing role in minority student access to computers. More white than black students have used a computer. More white students are studying with computers and have computers at home. The differences are especially evident at the lower grade levels.

Statistics indicate that low income elementary schools consistently have less access to microcomputers. The trend disappears by the time students enter middle schools and high schools, but providing more microcomputers at this point may be too late for the at-risk student.

It appears that socioeconomic factors not only have an effect on access, but also on the **pattern of use** of computers. For example, Becker (1984) found that higher SES students associated computers with open-ended computer use, while drill and practice was associated with lower SES. Others have noted the same phenomenon:

- 56% of the use by low SES students was for drill and practice and 13% for programming, and 39% of the

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use of high SES students was for drill and practice with 30% of the use for programming (OTA, 1987).

- 32% of white students owned computers, compared to 22% of black students and 21% of Hispanic students (Martinez & Mead, 1988).

- The computer controls low SES students, while the high SES students control the computer (OTA, 1987).

Are there other factors related to equity?

There may be other factors related to equity. For example, Roblyer et al. (1988) reviewed 80 studies and concluded that **software** developed for the general population was not successful when used with minority, disadvantaged and Spanish speaking populations.

In Utah, **keyboard time** was found to range from 36 to 142 minutes. Interestingly, students using teacher-directed software spent more time at the keyboard, regardless of grade level, than students using Integrated Learning Systems (Bluhm, 1992).

Do standards play a role in solving inequity problems?

Equal access for students, teachers, administration and parents should be a goal for every district.

A standard can alleviate inequities. These standards can be as general as "enough stations in every school so the students have a chance to put their learning to use." Or, as specific as the International Society for Technology Education's claim that by 1995, there must be student/computer ratios of 5:1 with a range of supporting technologies (CD-ROM, video disc, VCR's, camcorder, group display equipment) (Vision: Test, 1990).

The Kent School District Plan (1990) recommends 1) key board time at 46 to 60 minutes per day, 2) six computers to a teaching station with appropriate software and one printer for every three computers, and 3) a ratio of ten computers to one student (Kent School District Plan, 1990). This plan has also been recommended by several national task forces.

What factors should school policies consider?

The Norfolk (VA) School Division and the Houston (TX) School District have incorporated some of the following notions into their technology policies:

1. Include all faculty in training; female teachers are appropriate role models for female students.
2. Expose all students to computers in at least one learning situation.
3. Select software on the basis of appeal to both sexes, all economic levels, and all ethnic groups.
4. Select software that appeals to all types of students.
5. Have computers in library available for student users.
6. Provide extracurricular computer activities for students.
7. Offer parent training sessions.
8. Involve special education teachers.
9. Infuse computers into the curriculum (F. M. Black Model School Houston).
10. Apply technology in the areas of greatest need for administration and instruction (Norfolk School Division Plan, 1988).

John Pisapia

Phone: 804 828-1332
FAX: 804 828-0479
Internet: JPISAPIA@VCUEDU

The information found in this research brief has been synthesized from the MERC publications listed below. To obtain a copy, please contact the MERC office.

Pisapia, J. (1993, April). Learning technologies in the classroom: Case studies of technology intensive schools. 64 pp. ($8.50)

Pisapia, J., Schlesinger, J., & Parks, A. (1993, February). Learning technologies in the classroom: Review of the literature. 213 pp. ($10.00)

Pisapia, J. & Perlman, S. (1992, December). Learning technologies in the classroom: Study of results. 134 pp. ($8.50)